

REMARKS

The Office Action dated June 1, 2005 has been carefully considered. Claims 1 and 5-7 have been amended. Claims 8-21 have been added. Claims 1-21 are pending in this application. No new matter has been entered.

35 U.S.C. § 112

Claims 1-7 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Specifically, the Office Action indicates that it is unclear how the distillation column recited in step (i) of claim 1 is used in any of the steps. In response, claim 1 is amended to specifically define the distillation column as at least one selected from the group of an acrolein separation column, an azeotropic dehydration column, a heavy-ends column, maleic acid separation column, an acetic acid separation column, and a purifying column. Support for this amendment is found throughout the specification and specifically on page 8, lines 10-17 and page 27, lines 12-16.

The Examiner has also rejects to the recitation of "stages" in claim 1. The term is deleted by the current amendment and replaced with "steps".

The Office Action also indicates that it is unclear where the reflux comes from. Claim 1 is amended to identify that the polymerization inhibitor is introduced at any point except at a step for supplying a raw material which is complying acrylic acid-containing liquid to the at least one distillation column, and also at any point except the step for supplying a reflux to the at least one distillation column. Support for this amendment is found throughout the specification an in particular on page 28, line 26 to page 29, line 1. The raw material and reflux are supplied to the distillation columns at the same portion or separately from different portions. With regard to the specifically identified distillation columns in the claims as currently amended, the reflux comes from the following sources. In the acrolein separation column 22, the reflux comes from an absorption column 20 through the line between the absorption column 20 and the acrolein separation column 22. In the azeotropic dehydration column, the reflux comes from the condenser 31. In the heavy-ends cut column 40, the reflux comes from a portion of the

condensed top gas. In maleic anhydride separation column 46, the reflux comes from a portion of condensed top gas.

35 U.S.C. § 102

Claims 1, 2, 4 and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,252,110 to Uemura et al. This rejection is traversed. Uemura et al. do not teach key elements recited in the invention as currently claimed.

Uemura et al. disclose the step (f) for obtaining crude acrylic acid and a high boiling substance-containing solution by removing the high boiling substance from said crude acrylic acid (including the steps (a) - (e)), and the step (g) for recovering acrylic acid by thermally decomposing an acrylic acid oligomer contained in the high boiling substance-containing solution. However, Uemura et al. do not teach the step of introducing the polymerization inhibitor to a distillation column at any point except a step for supplying a raw material which is complying acrylic acid-containing liquid to the at least one distillation column, and also at any point except the step for supplying a reflux to the at least one distillation column. The Office Action indicates that the step of introducing a polymerization inhibitor is disclosed in Uemura et al., but does not cite to where it is disclosed. Uemura et al. are silent regarding where and at what point the introduction of the polymerization inhibitor is introduced.

In contrast, in the method in accordance with claim 1 as currently amended, the polymerization inhibitor is introduced to at least one distillation column selected from the group consisting of the acrolein separation column 22, the azeotropic dehydration column 30, the heavy-ends cut column 40, maleic acid separation column 46, the acetic acid separation column 80, and purifying column 110 at a specific position in the column except at a step for supplying a raw material which is complying acrylic acid-containing liquid to the at least one distillation column, and also at any point except the step for supplying a reflux to the at least one distillation column. Therefore, Uemura et al. do not teach the introduction of the polymerization inhibitor in the specific manner as currently claimed in claim 1.

New claim 12 is added and incorporates step (ii) from previously presented claim 1 into a new claim. New claim 12 recites the step of "by performing supplying the acrylic acid recovered by thermally decomposing said acrylic acid oligomer to said azeotropic dehydration column."

With regard to this aspect of the invention, Uemura et al. do not teach to supply the acrylic acid recovered by thermally decomposing the acrylic acid oligomer to the step (e). That is, in Uemura et al., the decomposition product (e.g. acrylic acid) is supplied mainly to the thin film vaporizer 3, and a smaller amount of the decomposition product is supplied to distillation column 2, which is not the same as step (e) for obtaining crude acrylic acid by dehydration and/or removing a low boiling substance from the aqueous acid-containing solution. Further, a low boiling substance at the distillation column 2 is recycled to a high boiling impurities separation column 1 in the process of Uemura et al. In the method in accordance with new claim 12, the acrylic acid recovered by thermally decomposing the acrylic acid oligomer is supplied to the step (e), and therefore not taught or suggested by Uemura et al.

35 U.S.C. § 103

Claims 3, 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uemura et al. For the reasons discussed above, Uemura et al. do not disclose or suggest key elements of the claims from which these claims depend. Therefore none of the pending claims are obvious in view of Uemura et al.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should he believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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